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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,187	05/01/2007	Karl-Ernst Hummel	037141.57706US	8422

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EXAMINER

HAMO, PATRICK

ART UNIT	PAPER NUMBER
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3746

MAIL DATE	DELIVERY MODE
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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/578,187	Applicant(s) HUMMEL ET AL.	
	Examiner PATRICK HAMO	Art Unit 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 May 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>5/4/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claim 11 is objected to because of the following informalities: the word “at” in line 2 of the claim seems to be a typo for --a--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 14-15 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a widened spiral channel, does not reasonably provide enablement for a spiral channel with a cross section that “may be varied by widening of the spiral channel in the radial direction relative to the turbine shaft.” The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims. The specification seems to contemplate that, in the design stage of determining the width of the spiral channel, it may be beneficial to contemplate varied cross sections of the spiral channels on turbine and compressor side, such that different widths would allow a simplified construction. However, the claim is not drawn to a process step of designing the apparatus, but to the apparatus itself. Once the apparatus is constructed, the width of the spiral channel in the radial direction at any given

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point, even if different or "varied" from other points in the channel, is determined and no longer "may be varied by widening." Examiner interprets this limitation as "the width of the cross section of the spiral channel varies in the radial direction relative to the turbine shaft."

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 12 recites the limitation "the cover". This presumably refers to the cover first positively recited in claim 10. However, claim 10 includes the limitation "a cover is provided on the compressor side or on the turbine side or on both." This is three different possible possibilities, the third of which requires two covers. Therefore, it is unclear whether claim 12, which only recites "the cover" in the singular, covers this third claimed possibility. For purposes of examination, this limitation is interpreted as covering each possibility, however clarification is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reynolds, US 4,598,542 in view of Roemuss et al., US 2005/0069427.

In regard to claim 10:

Reynolds discloses a fluid flow engine comprising a central housing part (core 28) in which a turbine shaft 16 is mounted, the housing part having a turbine side (to the right in fig. 1) and a compressor side (to the left in fig. 1) and being integrally molded as part of the housings for each side (volute 36 and 40 are carved into the core, defining the spaces where the compressor and turbine reside), wherein a turbine inlet 42 is arranged tangentially to the turbine shaft 16 on the turbine side and a turbine discharge arranged axially on the turbine side (routing fluid from the turbine 14 to diffuser 52), a compressor outlet 38 arranged tangentially and an inlet (at 32) arranged axially, wherein both sides are provided with covers (plates 24, 26), and the volutes 36, 40 providing for flow between the tangential connectors and the axial connectors for each side. Reynolds does not disclose that the volutes are spiral channels.

However, Roemuss teaches a housing for a fluid flow engine including spiral channels 6 and 7. Roemuss teaches that ordinarily the supply channel 6 and discharge channel 7, corresponding to volutes 36 and 40 of Reynolds, may be formed annular or spirally in a fluid flow engine such as that taught by

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Roemuss or Reynolds (paragraph [0012]). Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to have substituted the spiral channel of Roemuss for the volute of Reynold to achieve the predictable result of providing channels for the flow of fluid in a fluid flow engine.

In regard to claim 11:

The fluid flow engine of Reynolds is a turbocompressor (having a turbine driving a compressor), which produces a mass flow delivered from the turbine 14 to the diffuser 52.

In regard to claim 12:

Both covers (plates 24, 26) of Reynolds are essentially planar and face the central housing (core 28).

In regard to claim 13:

Both volutes 36 and 40 of Reynolds are formed by parts of the core 28 and plates 24, 26. In combination, the spiral channels as taught by Roemuss would also be formed by the plates and core.

In regard to claim 14:

The spiral channels 6 and 7 of Roemuss have a maximum depth at the lower and upper portions, respectively, shown in cross-section in fig. 1. Note that

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each of spiral channels are wider at the labeled portion (6 on bottom, 7 on top) in the direction of the shaft, left to right in the figure, than at other portions. As seen in fig. 2, the width is varied in a radial direction relative to the turbine shaft. This is a customary feature of the spiral channel of Roemuss that one skilled in the art would have found obvious at the time of the invention to include in the combination of Reynolds and Roemuss.

In regard to claim 15:

The spiral channels of Roemuss do not substantially overlap so that they can be arranged in any rotational position relative to each other, as their specific maximum depths do not align. Any tangential position may be accomplished depending on the alignment of bolts 19 and 22.

In regard to claim 16:

The connections 38 and 42 of Reynolds are inserted tangentially, then angle out and extend toward the volutes 36 and 40 in a direction parallel to the turbine shaft 16.

In regard to claim 17:

In combination with the spiral channels of Roemuss, any tangential position may be positioned with either connection (see discussion of claim 15 above). Therefore, each connection can be positioned at any angle to the axis of

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the turbine shaft in a tangential position depending on the design requirements and constraints of the turbocompressor system.

In regard to claims 18-20:

The connections 38 and 42 of Reynolds are arranged on compressor and turbine side covers, respectively. The connections go through the core and into the volutes defined by the cover plates.

In regard to claim 21:

The parting plane of Reynolds, where the covers (plates 24, 26) meet the central housing part (core 28), is situated essentially centrally in each of the volutes (see fig. 1), such that they would be situated centrally in each of the spiral channels in combination.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kessler, US 2,456,128, teaches a centrifugal pump with an inlet connection 15 that may be arranged at a variable angle.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICK HAMO whose telephone number is (571)272-3492. The examiner can normally be reached on M-F 8:30-5.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art
Unit 3746

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